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The American Biology Teacher

Vol. 9 OCTOBER, 1946 No. 1

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PUBLISHED BY
The National Association of Biology Teachers

Entered as second class matter October 26, 1939, at the post office at Lancaster, Pa., under the Act of March 3, 1879.

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The American Biology Teacher

Vol. 9 OCTOBER, 1946 No. 1

Tinian Field Trips

TED DOWNS
University of Kansas, Lawrence, Kansas

"Kingfisher! That's a kingfisher, Ted!" So the boys exclaimed every time they heard or saw any bird on Tinian. The White-collared Kingfisher did make most of the clatter among the birds. So my answer to their question "What's that bird?" was usually "Kingfisher"; hence my buddies classified all birds as such.

It all goes back to my wandering around with a pair of battered field glasses to check some of the bird life on Tinian. During my period of duty from May 31 to October 17, 1945, I made about sixty trips on this small, low, thirty-eight square mile island. I spent most of my time at Hagoi Lake, a small marshy area full of papayas, bananas, and many other varieties of vegetation surrounding the tropic-like spot. The army had left some evidences of its activity, but as a whole the place was the one area on the island maintaining a natural character. It was here that we (Sgt. Eugene Cypert, former student at Kansas State, Manhattan, Kansas, Lt. Joel Canby, former student at Colorado College, and I) saw our largest variety of birds, contrasting from the tiny warbler-like greenish-yellow White-eyes to the large white phase birds of the Reef-Herons that moved slowly about the edges of the murky pools. The White-eyes, which possessed clear white eye rings, rarely bothered to stop their constant dash for food in the trees and brush. The Reef Herons roosted out in the center of the lake and seldom allowed close observation. One lucky afternoon at the other end of the island along a rocky low sea shore, I saw two adults of this bird feeding on the small coral fish. They were in exact contrast to the young birds; a dark, slatey blue overall cast and greenish yellow legs. By checking Ernst Mayr's excellent handbook *Birds of the Southwest Pacific* I was sure of their identity as adult Reef Herons.

Another very interesting inhabitant of the lake was similar to our American Mud-Hen or Coot, the Moorhen or Gallinule with its red face and white rear flesh feathers. We saw several of these—but only at the lake—bobbing

their thick heads back and forth as they wandered and chased each other around the water. Occasionally we were given an opportunity to see a bittern lurking back in the reeds or suddenly wing in from some tadpole pond or pool in another area. These were Chinese Least Bitterns, reminding me of our American Bittern.

Back in the forest surrounding the lake we were privileged to watch two Tinian Monarchs feed their dark-skinned helpless young, a single bird completely filling the woven nest resting in a three-way crotch of a low bush. Monarchs are flycatcher-like, russet beneath and soft grey above, uttering a familiar peeo whirl much like our Wood Pewee. One day we discovered a pair of more brilliant flycatchers, the Rufous-fronted Fantails, very well described by their name, with added flashes of white around the forehead, throat and tail and just in front of the tail another rich rufous patch.

Doves came to the lake, especially the Philippine Turtle Dove. This bird, common all over the island, was larger than our Eastern Mourning Dove and had a bright lavender patch on the back of its neck. Another dove very rarely made itself known high in the boughs of papayas or other trees. It was the White-throated Ground Dove, brown below and unusually white in contrast throughout the throat and head. Once I saw one other strange dove—the Marianas Fruit Dove, certainly a tropical appearing creature with its rosy red face, soft yellow-green neck, wings and back, and yellow-orange belly.

Common along the lake were the talkative Micronesian Starlings, always together in noisy groups near the tops of the trees. They were conspicuously minus the speckles we see on our Starlings at home.

There were of course other animals to see at the lake, not so much in variety, but plenty in quantity, particularly the lined skinks. The little "Geckos" with their suction-pad feet were found among the skinks, but they also enjoyed serenading us up on the ceilings of our huts at night, soloing in their squeaking cricket-like voices. And Hagoi Lake was literally swarming with the tadpoles of the large adult toads that jumped all over the forest floor and even in our front yards. Small top minnows were common around the edges of the lake. We never captured, nor did I get a chance to see the much talked about Monitor Lizard.

At one particular spot, a 200-foot cliff in the center of the island, the very beautiful white Fairy Terns gathered in flight above the cliff, sometimes awk-

wardly lighting or roosting on the tangled thick tree roots of the wooded cliff. Along the roads of the island we usually caught sight of roosting kingfishers, Philippine Doves, and occasional starlings on the telephone wires.

Of course, there were interests along the sea shores; the countless coral fish, crustaceans, peculiar sea cucumbers, small octopi, shells, eels and a few shore birds.

Some may wonder whether any other birds occurred—none that I could vouch for except one pair of Cardinal Honey Eaters I saw once in June at the extreme north end of the island—a brilliant black and red male, with long down-curved bill, pursuing a very drab female. This species I never saw again.

The field trips were the real fruits of my biological study. I made notes, identified and collected plenty of useless (and possibly some useful) items, and also provided humor, interest and entertainment for many other people. Many of the onlookers actually expressed envy of my interest. I can only thank my father for our countless outings, the natural enthusiasm he expressed, and his foresight in owning a pair of binoculars which I could use. I also feel thankful for field-minded instructors later in life. There can be no substitute for getting out in Nature to see the real thing, under the supervision of an enthusiastic leader. I hope all schools will provide facilities for such endeavors, possibly working out transportation problems in cooperation with other extra-curricular activities. It is worth it. My good fortune in home and school environment paid high dividends on Tinian (as it has elsewhere and will of course continue to do).

"Singing "Gecko"

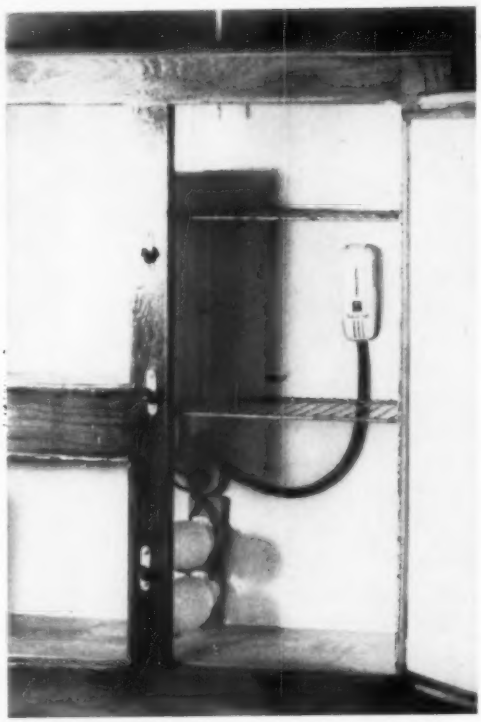
Rufous Fronted Fantail

An Improvised Incubator for Bacteria

After reading Mr. Lacroix's article in the January, 1946, issue regarding the use of a kitchen pressure cooker as an autoclave it occurred to me that my experience in improvising a bacteria incubator might be useful to some biology teachers. The incubator needs of my laboratory did not warrant the financial outlay required to purchase a regular laboratory incubator but I did need something that would maintain warmth and moisture for growing my desk cultures and occasionally those of the students.

I secured an old ice refrigerator with the ice compartment door opening in front. The school carpenter removed the bottom drain pan compartment and substituted metal buttons for legs. The inside was re-enameled and the outside re-varnished. The school electrician installed two 100-watt electric light bulbs near the bottom as a heating element. These were wired in series to increase their life and to reduce the amount of light. A furnace control thermostat was installed about the center of the inside back and this was wired in series with the light bulbs. Current was conveyed into the box by a lamp cord through a hole bored in the back immediately behind the thermostat. A switch was conveniently placed on the outside to shut off the current when the incubator was not in use. It was necessary to change the thermostat to regulate temperatures higher than those used in heating a house. This was done by bending the indicator slightly. A thermometer, fitted through a cork, was inserted through a hole bored in the top of the box so that most of the scale was visible outside. After some experimentation I was able to set the thermostat so that the current would go on and off at about 37° C., the most satisfactory single temperature for growing laboratory cultures which require incubation. A can of water was placed on the bottom shelf to insure sufficient humidity. The water surface provided by an ordinary low type coffee can gave the incubator a humidity of 50 or 60 which proved to be satisfactory. A greater water surface provided by a pie pan will increase this.

The total cost of my "incubator" was a little over ten dollars, not including labor. It serves the purpose very well in my classes in Home Economics Bacteriology. To be sure there is no quick way to change the thermostat to a different temperature accurately but I have found this unnecessary in the work I am doing. A more accurate and expensive thermostat would accomplish this.



Merrill B. Iams,
State Teachers College,
Indiana, Pennsylvania.

Professor A. Franklin Shull, Department of Zoology, University of Michigan, Ann Arbor, Michigan, is still interested in receiving lady beetles from all parts of the country. See his articles in the March and May, 1945, issues of The American Biology Teacher, and his advertisements in various issues of Volumes 7 and 8. Here is an opportunity for teachers and pupils interested in collecting to combine fun with a real contribution to the development of the sciene of genetics.

Class Demonstration of the Effects of Heavy Metals upon Bacterial Growth

JOHN B. GERBERICH[1]
Department of Zoology and Entomology, Ohio State University, Columbus, Ohio

Metals and their compounds are often used as germicides and as inhibitors of growth, as in such compounds as iodine tincture, merthiolate, silver nitrate, argyrol and blue vitriol. A striking and simple demonstration of some of these properties of metals can be made by special students as a classroom project or by the teacher as part of a demonstration-lecture period for the entire class.

The materials consist of coins, dishes with covers (Petri dishes) but not necessarily sterile, test tubes, funnel, ring stand, three-inch piece of rubber tubing, six-inch piece of glass tubing, pinchcock clamp, cotton and nutrient agar. Agar may be prepared in the class room by mixing dehydrated nutrient agar[2] with water as directed by the manufacturer in proportion to the quantity of material desired. Boil the mixture until the agar is dissolved. Filter through absorbent cotton. Wet the cotton with boiling water before pouring the agar. Attach to the stem of the funnel a piece of glass tubing with a three-inch piece of rubber tubing (Figure 1). The glass tubing should be of sufficient length to reach half or more of the depth of the test tube. This will aid in keeping the upper portion of the test tube free from the melted agar. Place a pinchcock clamp

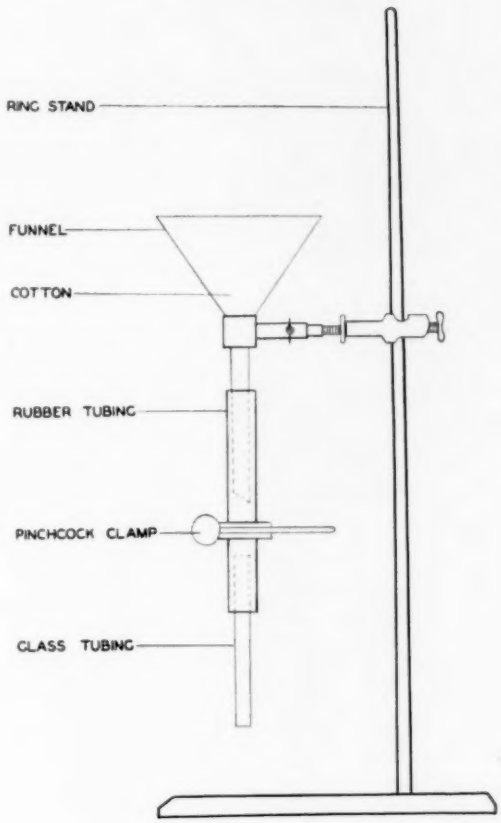


FIGURE 1

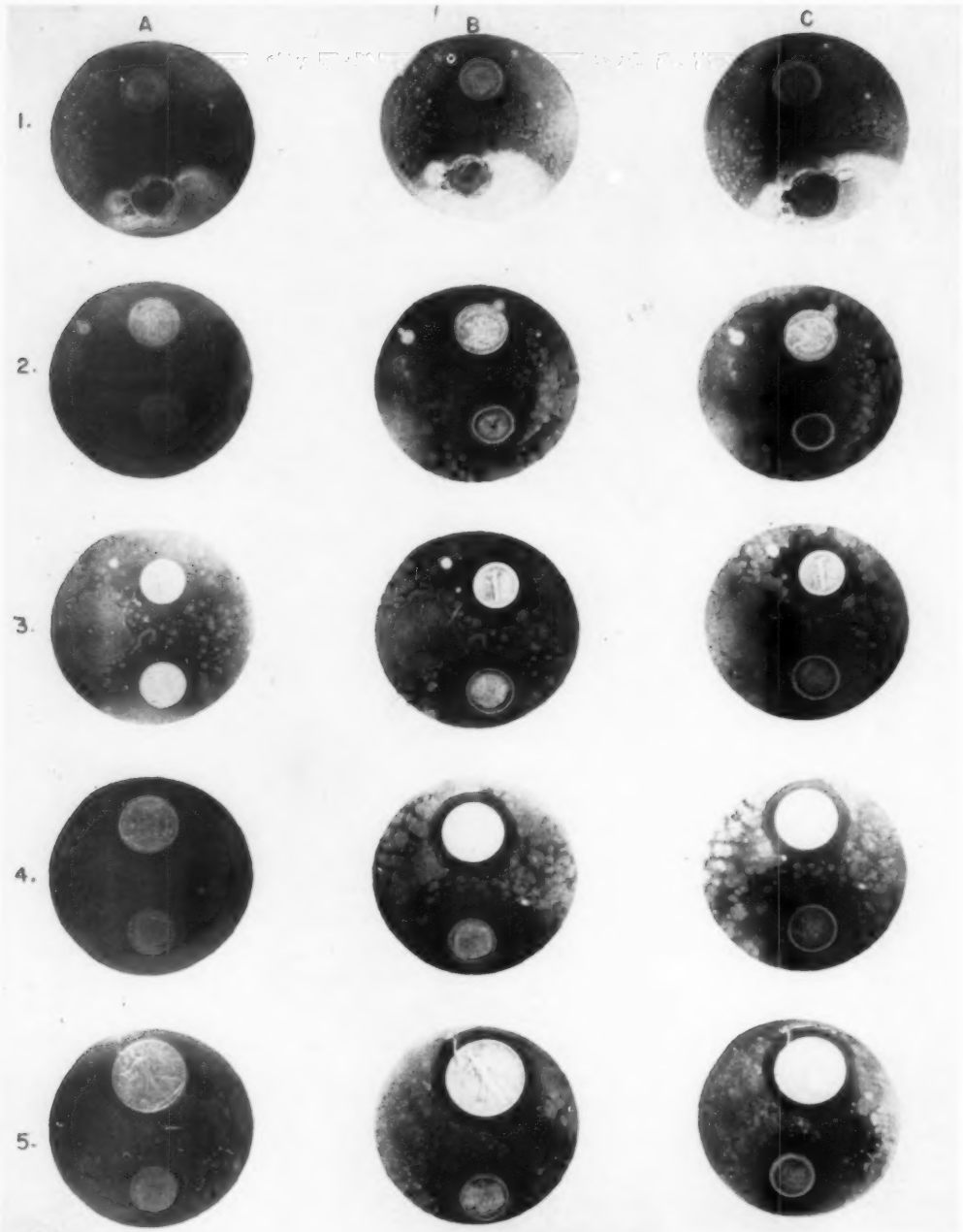
on the glass-free portion of the connecting rubber tubing.

If it is desired to set up the demonstration immediately the agar may be poured directly into the dishes rather than stored in test tubes. By regulating the pinchcock clamp fill the bottoms of the dishes with about ¼ inch of agar. Cover each dish with a lid and rotate the dish gently to assure even distribution of the agar. Since bacterial growth is desired, aseptic procedure need not be

[1] The author wishes to thank Fred. H. Norris, Dept. of Botany, for his aid with this demonstration.

[2] Bacto Nutrient Agar, is sold, by Difco Laboratories, Detroit, Michigan, either in the dehydrated state or in sterilized tubes.

Editor's note: Since writing this article the author has joined the staff of Michigan State College, East Lansing, Michigan.



enforced. After the agar has hardened the excess moisture which condenses on the under-surface of the lid may be removed, thus avoiding the smearing of the bacterial colonies by the drops of water running across the agar's surface. Place the coin or coins on top of the agar after it has solidified. The author suggests the use of no more than two coins per standard Petri dish, or dishes of similar size. If pressure is applied to the top of the coins while placing them, it will force the coin into the agar sufficiently so that it will remain fixed.

If the agar is to be stored for a future date or if the experimenter desires to use the agar under aseptic conditions[3] it should be placed in test tubes and sterilized. Placing the extended glass tube of the funnel stem into a clean sterile test tube, fill the test tube about ⅓ full by regulating the pinchcock clamp. The same process may be continued until the desired number of tubes has been filled. Care should be taken not to get the melted agar on the wall of the test tube above the liquid level. Plug the test tubes with cotton. The plugs may be made either by rolling the cotton or merely by plunging cotton into the test tube with a solid glass tube, pencil or some other blunt tool. The plug should be sufficiently tight to support the tube when lifted up by the cotton plug. Set the plugged test tubes in an upright position in a double-boiler and sterilize for one hour. Place the sterilized test tubes in an upright position in a cool place until the agar hardens. If the medium shows contamination after 24 to 48 hours repeat the sterilizing process.

Whenever the time approaches to set up the demonstration, place the tubes of agar in a pan of water and heat until the agar melts. Have clean dishes (Petri dishes) available and organized in some orderly fashion, take one of the test tubes containing the melted agar from the pan, remove the cotton plug and empty into one of the dishes. Follow the same procedure as mentioned above until all the desired dishes have been set up.

The demonstration illustrated here was set up by the method described above with five different kinds of coins. The first group, illustrating the inhibiting effects of the copper penny and the recent war-time alloy penny; the second, the copper penny and the nickel; the third group was set up with a copper penny and a dime; the fourth, a copper penny and a quarter and the fifth group, a copper penny and a half-dollar. The results may be observed in Plate I and have been recorded in Table 1. The series of photographs on Plate I represents examples taken from a total of 100 plates, 20 plates from each group. The left column was taken 72 hours after the demonstration had been set up. This is referred to as row "A." Row "B," the same plates, 144 hours after the beginning of the demonstration, and row "C," the plates after 240 hours. The demonstration was left intact for 24 days but no apparent changes were noted after the first ten days.

TABLE 1

Width of Inhibited Zones

	At 72 hours	At 144 hours	At 240 hours
Copper penny	8 mm.	11 mm.	11 mm.
Alloy penny	17 mm.	17 mm.	19 mm.
Nickel	0 mm.	0 mm.	0 mm.
Copper penny	8 mm.	8 mm.	8 mm.
Dime	8 mm.	8 mm.	8 mm.
Copper penny	12 mm.	12 mm.	12 mm.
Quarter	12 mm.	12 mm.	12 mm.
Copper penny	12 mm.	19 mm.	21 mm.
Half-dollar	8 mm.	14 mm.	14 mm.
Copper penny	14 mm.	17 mm.	17 mm.

DISCUSSION

The analysis of the demonstration is made upon the complete composition of the coins used rather than any specific metals associated with any particular coin. All coins except the nickel produced a "halo" or inhibiting zone. This effect seemed to be active in three dimensions,[4] inhibiting the growth of the bottom as well as the surface organisms.

[3] MILLER, D. F., and G. W. BLAYDES. *Methods and Materials for Teaching Biological Sciences.* McGraw-Hill Book Company, Inc. New York. p. 190–191. 1938.

[4] NADSON, G. A., et C. A. STERN. "De l'action a distance des metaux sur les bacteries et les levures." *Compt. Rend. Acad. Sci.* (Paris) 194 (18): 1597–1600. 1932.

The copper penny seemed to produce the largest zone, followed by the alloy penny, quarter, half-dollar and dime respectively. The nickel did not inhibit bacterial or fungous growth at all according to this demonstration. As the inhibiting zone or "halo" increased in dimensions the bacterial and fungous growth seemed to decrease and finally became completely lacking. Copper compounds such as: copper sulphate, copper wire, and copper sulphide, are used in aquaria and other water reservoirs to inhibit the growth of bacteria, fungi and algae. Silver compounds are used as germicides in mouth-washes, wound disinfectants and preservative stains.

SPECIAL ISSUES

Special Issues of THE AMERICAN BIOLOGY TEACHER were planned in 1940 and inaugurated with the appearance of the *Field Trips Issue* in October 1941, with Lee R. Yothers of Rahway, New Jersey, as guest editor. The Special Issues have brought forth more favorable comment and created more demand for continuance than any other feature of the Journal. For the first time since October 1941, not a single Special Issue is ready for even a tentative announcement, although one, *Laboratory Aids and Substitutes,* is under way. This is an invitation to all of you who are interested in assisting in any way in the production of specials in certain fields to make yourselves known to the editor or one of the staff. And if you can suggest a good guest editor, so much the better.

Making Nature Study A Game

Several years ago I discovered a teaching device for my Biology classes which has proved so satisfactory that I am glad to share the idea with others. It is an electric chart for Nature Study. The idea is not original with me. Directions for making the chart may be obtained from the *National Audubon Society, 1006 Fifth Ave., New York 28, N. Y.* However, I have adapted the chart to uses other than just birds.

The chart is made of ply board, 34×49 inches, with a small molding around the edge. On this board are mounted by photo corners fifty post card size pictures ($3\frac{1}{2} \times 5\frac{1}{2}$ inches). Under each picture is a brass paper fastener for the electric contact. At the right of the board, printed, on strips of paper, are the names of the birds portrayed, arranged in alphabetical order, each with another brass paper fastener for the electric contact. Above this is a small electric light bulb connected with a dry cell battery and two rubber-coated wires for finders. These finders are electric test prods and may be secured at a radio supply store. On the back of the board, the paper fastener under each picture is connected by an insulated wire to the fastener opposite the name of the bird. When the pupil gets the correct name of the bird the circuit is completed, turning on the electric light.

This is a self-teaching device and in these rushing days, any teacher is glad for such time and labor-saving devices. This same board can be used for a number of different Nature subjects. The photo corners remain on the board and it is very simple to remove one set of cards and put another set in its place. The rewiring on the back of the board takes more time but it is not too difficult

With the aid of the *National Geographic Magazine, Nature Magazine, The Wild Flower Preservation Society, the National Audubon Society,* five and ten cent store booklets, and "An Album of Trees" published by Samuel Gabriel

Sons and Co., seven different sets of pictures have been prepared and are placed on the board from time to time. There are two sets of insects—one of Lepidoptera and one of other insects; two sets of birds—one of the larger birds such as hawks, owls and ducks, and one of smaller birds; one set of flowers; one set of fur-bearing animals; and a set of tree pictures. The tree pictures are shown in the illustration.* This is a very fine set of pictures showing the tree bark, leaf, flower and fruit.

While not all pupils are interested in the chart, many work for hours until they learn the whole fifty. Although this type of Nature Study does not take the place of actually getting out of doors and learning about trees, flowers, birds, insects and animals at first hand, yet where such trips are not possible, a chart like this is a good substitute. Pupils give personal testimony that at least part of the information gained from the chart carries over into later life in the out-of-doors.

FLORENCE E. CLIPPINGER,
Roosevelt High School,
Dayton, Ohio

* Photo by Edith S. Sauer, Dayton, Ohio.

BY THE WAY

BIRD NESTS may be collected in the fall. They are easy to find after the leaves are off the trees. The nests may be made more durable by spraying them with a "solution" of one part LePage's glue and three parts water.

DURING THE FALL MONTHS and even in winter in many parts of the country, roadside ditches are a source of large numbers of interesting aquatic animals for a small aquarium; especially crustacea and the various stages of aquatic insects.

MOSQUITO WIGGLERS provide an excellent occasional live meal for aquarium fishes. The wigglers may be collected in fish-free pools until the first frost.

What Wildlife Information Should Be Taught in the Schools[1]?

WALTER P. TAYLOR
Leader, Texas Cooperative Wildlife Research Unit,[2] College Station, Texas

In my opinion, it is not so important to teach comprehensive wildlife facts in the school as it is to inspire in each pupil a sympathetic interest in Nature and an appreciation of it.

In my experience, small children are universally interested in insects, worms, fishes, snakes, lizards, mice, and birds. It does not take long, however, for their parents, friends, and teachers to stamp out this interest and to put in its place blind prejudice and even fear. Some of the results you can see clearly by consulting your own feelings as I read the list of these creatures, some of them popularly regarded as slimy and unattractive.

As a matter of fact, mankind has numerous important and interesting friends, as well as some dangerous enemies, in these various groups. He should learn to discriminate intelligently in his dealings with them; surely he should be able to recognize his friends as well as his enemies.

We commonly think of insects as bugs and pests, but on second thought we realize that many, if not most, of the insects are beneficial, important in controlling the harmful kinds, and serving as food for birds and mammals.

Many years ago a great scientist demononstrated the fundamental importance of the earthworm as a soil builder.

It is possible that man's existence in some places has been made possible by the involuntary services of these humble animal associates. Why shouldn't our children be encouraged to appreciate these important activities which go on without our thought and without any compensation or taxation on our part?

Fortunately, there is more public approval of the fishes than of some of the other humble animals, but even with these there is room for improvement.

Among the handsomest and most interesting of our animal associates are some of the snakes and lizards. There is not a single poisonous lizard in Texas, and only one poisonous lizard in the whole world, although some persons think all of them are deadly.

With the snakes the case is different. A number of ours, including rattler, copperhead, moccasin and coral snake, are really dangerous, but the vast majority are entirely harmless and even valuable as parts of Nature's governing and balancing apparatus. As with the insects it is important to recognize the dangerous snakes, but the harmless and beneficial ones should be known also. Neither our children nor ourselves need live in terror of non-existent dangers. Knowledge is the best antidote for fear.

Perhaps I don't need to say much about the mammals, known to most of us as animals, or about the birds. Fortunately, there is much greater appreciation of these, our friends in feathers

[1] Part of a panel discussion on "Integrating Resource-Use Education" at the 13th Annual Midwinter Conference of School Executives, Supervisors and Teacher Educators, Austin, Texas, Jan. 8, 1946.

[2] Fish and Wildlife Service, United States Department of the Interior; Agricultural and Mechanical College of Texas (research, education, extension); the Texas Game Fish and Oyster Commission; and the American Wildlife Institute, cooperating.

and fur, than of some of the lesser members of our community. And still there is too much of a tendency to want to kill everything that moves. "Kill it, damn it, it's alive!" is as inappropriate as it is unattractive as a slogan for the human race.

There can be no objection to harvesting surpluses of agricultural crops, as of oats, wheat, cotton, forest trees, or livestock, nor can there be sensible or legitimate objection to the taking of natural crops of wildlife, as of fish and game. But the harvest should be intelligently made on the basis of facts rather than personal convenience or prejudice or misinformation. Nor can there be any objection to reasonable control of animals which interfere with health or agriculture. But control activities, too, should be based on demonstrated fact and genuine need.

That we live in One World is becoming increasingly obvious. We cannot live to ourselves alone. Man is linked in a thousand ways to his plant and animal associates on the earth, yes, and to the soils, waters, and climate. This business of living is a complex enterprise. We must think of all phases of it. We cannot remain isolationists in Nature any more than we can as a nation among nations. The soils and waters, the atmosphere, the plants and the animals, including man, are all parts of a single great system of Nature and energy. If we hurt the great earth, we ourselves are injured in the process. This is the true significance of efforts for soil, water, grass, forest, and wildlife conservation, not so much for the resources involved, as for man, himself, to whose future survival these resources are essential.

I hope you will agree with me that these things are not of theoretical importance only, but on the other hand, they are in the highest degree practical.

If we work against Nature, if we regard her as something to be destroyed, fought, tamed, overcome, we are likely to be broken in the fight. But if we study Nature, learn how to work with her, to produce the crops which she likes best, to live in harmony with her, to care for her and all her children, and in turn to be cared for by her, we shall all get along better. By following this policy of insight and cooperation, the Russians used the bitter cold of Russian winter to help them to victory over the Germans on the eastern front. They have also made the Arctic Ocean north of Siberia into a useful Russian lake.

Seemingly, our very survival depends upon a sympathetic appreciation of Nature and a willingness to become acquainted with her to the point where we can work with her. If the requisite attitudes to assure these beneficent objectives can be inspired in the teachers, parents, children and young people, our future, as the dominant and responsible rulers of the world, will be a good deal more secure. Also we will be relieved of many nameless and unnecessary fears; and we will make a substantial contribution to those ideals of beauty, goodness, and truth which are so important to the future of civilization.

SUMMER CAMP COMMITTEE REPORT

The interest in field work and other outdoor education has been increasing in the past several years. Now the NATIONAL ASSOCIATION OF BIOLOGY TEACHERS has expressed an interest in establishing a camp to offer teachers training in field biology and possibly other outdoor techniques. The need for such training cannot be questioned. Many of this group will remember the questionnarie on secondary school biology sent out by Dr. Riddle, reported in *The American Biology Teacher* in 1941. Among the improvements in training suggested by the teachers, first

place was given to the desire for more special methods courses of a practical nature and fourth place to more field work. In the meantime, camping with all of its outdoor activities has come to be recognized as an important technique in education that has been too long neglected by schools. With the establishing of school camps, which seems to be the next big movement in education, there will be a great demand for teachers capable of working and living in a camp situation. The teacher will need not only to know field biology but also camping and woodcraft techniques. The almost universal cry of the camp directors we saw last summer during visits to 100 camps in New York in connection with a study of camp programs was for nature counselors who would know what to do in a camp situation. They did not want biology teachers because of past unhappy experiences with too much classroom approach. In a camp for teachers specializing in field biology camping techniques should undoubtedly be a part of the program.

The service such a camp could render is great. However there are two important factors that would make it seem inadvisable for NABT to establish a camp, first the cost and responsibility, second the problem of a location. Even the simplest camp requires a certain amount of physical equipment and capital outlay. One camp visited last summer with, it seemed to us, a minimum of buildings ,and equipment had an evaluation of $20,000. The only permanent buildings were a dining-recreation hall, office, latrines, store, and a pump house. The 75 campers were housed in tents, some of which had wooden platforms. The site of 96 acres with 2200 feet of lake frontage was heavily wooded but with very little level space and with no open field, marsh, nor shallow pond.

Admitting that an NABT camp would not be so large, the expense of establishing it, even with the only permanent shelter a place for rainy day activities, would still be great. If the camp were held on a state or federal owned site, as a state or national forest, park, or recreational demonstration area, the expenses would be lessened, but there would be some program difficulties because of the necessary limitations on such things as collections, cutting of wood, and fire building. In addition to the initial outlay, there would be the yearly running expenses—salaries, food, expendable equipment, publicity, repairs. Further, there is the responsibility of seeing that the camp operates, that food is ready, that sanitary equipment functions, that no one is injured because proper safety precautions were not taken.

When we went into one camp last summer, the director was trying to locate a plumber. The drains of the dish-washing tubs were stopped and the luncheon dishes were piled on the table waiting to be washed, while, with a hand pump, some of the campers were emptying the tub, spraying soapy water in all directions. In another camp the director interrupted our tour to see the camp in order to go check the chlorination of the water, a thrice daily task. In almost every camp some crisis was occurring or had just occurred.

Such an outlay and responsibility would probably be justified if by them the whole organization, the country over, could be equally and adequately served. But what would happen is obvious. A camp in the Middle West would attract mostly teachers from the Middle West, one in the East, West, North, South, people largely from those areas. The travel expense added to the camp expense would discourage some from attending. Others would choose not to go because the organisms in the camp area differed so much from their home areas. The methods, of course, would be applicable anywhere, but attendance at a California camp would be much more valuable to a California teacher than would attendance at a camp in Michigan until he learned his own species; then visits to other parts of the country would broaden his background.

Considering these facts NABT can make a greater contribution to the whole field of outdoor education by the influence it can exert on existing camps where field work is offered to teachers during the summer. These camps are scattered all across the country, in many different situations, so they would come within the range of local fauna and flora for almost any teacher, or could broaden the experience by presenting a new situation. It

is unfortunately true that these camps often do not offer a program that fits the need of the teachers. However, if the camp knew what was wanted it would be given. A camp committee of NABT could supply this information for the camps if we had an exact knowledge of what we do want. It would seem then that the greater contribution of NABT camp committee would be the formulation of a camp philosophy and the outlining of desirable activities, methods, and outcomes for camps as the schools may operate them.

Everyone interested in camping agrees that it is one of the most effective forms of education for social consciousness and many of the skills. Beyond these very general statements there seems to be little agreement on a camping philosophy, particularly for public schools. Schools are conducting camps. More schools will be doing so every year. If the biologists are ready in their own thinking, which is doubtful at present, they will be in a position to influence the direction that the school camp program will take, what can best be taught at a camp and what can best be taught in a school room. As we drove into one camp last summer, our first view was of an expanse of cut-over woods with the stumps still in place. On one stump stood a soprano singing as loud as she could, on another stump sat a girl practicing on a French horn, and near the center of the camp a band was assembling. All were dressed in street clothes. Two boys were trying to spear a fish just to be killing it. Was this camping? In another camp we found the children housed in houses with hardwood floors and central heat. Their camp life consisted of going from riding in a ring, to archery, to tennis, to dramatics, to modern dancing, to swimming, when the proper hour arrived. Was this camping? In another camp the boys were divided into two teams that competed against each other in baseball, soccer, tennis, ping pong, hockey, horseshoes, track and field events, and any other sports someone happened to mention. Very elaborate cups, plaques and other awards were given at the end of the season. Was this camping? Still another camp had to be reached by boat three miles across a lake, or by a five mile hike over a poorly marked trail. The campers were housed in tents or in Adirondack lean-tos in a woods on the lake shore. After two weeks in camp to learn techniques, they spent almost as much time away from the camp exploring the surrounding mountains as they did in camp. Was this camping? In another camp, the campers lived in groups of six or eight with two counselors. They built or rearranged their shelter, which was variable, to suit themselves. They built their own stoves and cooked most of their meals thereon. They had a garden plot of their own but also helped in the community garden. Their activities rose from the need of living comfortably in the out-of-doors. Was this camping? The trend that school camps will take is still not set. If we, as a group of teachers, can develop a camping philosophy we can help determine how school camps will evolve. If, however, we are unprepared, we will have only ourselves to blame if the program does not suit us.

After having developed a philosophy of camping and made recommendations of desired training to the schools of field biology, the committee on camping could still serve at least three very valuable functions. First, it could serve as a consulting agency to help the training camps put the recommendations into practice. Some of the camps might desire further amplification of the recommendations or help in finding qualified instructors. Reports on the progress in putting the ideas into action could be made to the interested teachers through *The American Biology Teacher*.

A second service could be the placing of interested, qualified teachers as camp counselors. I should like to emphasize the word *qualified*. At present camp directors do not like to hire biology teachers as nature counselors for in the past there has been too much carry-over of classroom attitudes and techniques. This has resulted in a marked unpopularity of nature work among many campers. However, if by our statement of philosophy, training recommendations, and leadership, we show that we are more awake

to the needs, they will probably soon turn to us for help.

A third very important service would be to provide a camp nature specialist to visit camps and help the nature counselors set up their programs. Such a service was offered to the 4-H camps of New York last summer. Only four camps made use of the service, but they were so well satisfied that the service has been requested again for this summer. The camps housed the specialists during the three or four days they were in the camp and paid their travelling expenses. As long as nature counselors remain as inadequate as most of them are now, this travelling consultant would probably be the greatest service we could offer to improve camp nature programs in all types of camps.

It is therefore recommended that instead of establishing a new camp for teachers with all the attendant expense and responsibility, a committee be appointed to do five things.

First, to formulate a philosophy of camping for NABT: the statement of the philosophy to include the broad values to be derived from a good camping experience, the specific aims or objectives that we want the camps to fulfill and the skills and knowledges that we consider would best be developed in a camp situation.

Second, to make recommendations of desirable content, leadership and procedures to existing camps that offer field biology training to teachers: these recommendations must include the amount and type of courses desired, whether they be field methods of teaching biology, content courses in the field, woodcraft techniques, camping philosophy, or other desirable material. They should also include suggestions as to the desirable type of housing for teacher-campers: tents and cook-your-own-food as at Yosemite Field School, or dormitories as at Woods Hole.

Third, to provide a consulting service to help the camps meet the recommendations and report the progress and results to the organization.

Fourth, to serve as a clearing house through which camp directors in search of nature counselors could contact qualified teachers.

Fifth, to provide a camp nature specialist to help nature counselors to set up their programs.

Dorothy C. Miller,
Iowa State Teachers College,
Cedar Falls, Iowa

The Ninth Year

With this issue, we begin the ninth volume of *The American Biology Teacher*. The forthcoming year promises to be the most successful one of the Association and the journal, continuing the progress of the past year which showed so much general improvement and many specific constructive changes. The St. Louis meeting set a new standard of enthusiastic cooperation. The Association has now established itself firmly as an influential body in the development of science teaching in the nation. The journal has acquired increased prestige among individuals, libraries, and advertisers. Readers have been more expressive in their comments to the editors and officers. The number of good manuscripts submitted is constantly on the increase.

But things are by no means perfect. We need a much larger membership in order to be truly representative of those who teach the life sciences. We need more advertising—this is important, not only from the standpoint of the budget, but because the advertisers are the individuals who actually supply the things with which we work. The interests of the journal and of its advertisers are mutual. We seem to need more agreement as to what we should be doing as biology teachers. The report of the summer camp committee indicates the need of the development of some general philosophies. The journal needs more

"practical" and illustrated articles, also more short items and news from local organizations. We need a few more associate editors from the ranks of the high school teachers, and we need better geographical distribution of our associate editors.

Our differences of opinion are many. Here are quotations from two letters which arrived during vacation: *From California:* "Biology as taught back East is certainly different than we teach it out west . . . the only reason I am still in your Association is that it is connected with the Southern California Association which speaks our western biology language." And from *Massachusetts*—"We in the East don't find much we can use. Your magazine is becoming more and more limited to western interests. . . . What it needs is more contributions from situations that make sense in eastern schools."

One is tempted to believe that these two teachers are seeing only portions of their fields; however, this nation is so tremendously big that perhaps it is impossible for any one publication to "cover" it, even in such a specialized field as biology. Then again, biology is the science of life and perhaps the very variability that makes life what it is also makes such divergence of opinion inevitable.

It is only fair to the editorial staff to mention that these two are the only letters in this vein we received in the past two years, while a considerable number from almost all parts of the country have commended *The American Biology Teacher* for its breadth of interest and effective coverage.

Once more, the editor repeats the timeworn but true statement that our kind of journal belongs to the readers and that all he can do is to make his best guesses as to what the readers want. Since he cannot contact each of them individually, he must depend on the editorial staff, meetings, letters and interest blanks and the like. From all sources available, it seems that our readers have not changed their desires much in five years. What they seem to want is about as follows: mostly practical articles, plenty of illustrations, a few special issues, more articles on laboratory and visual aids, continued emphasis on field biology and conservation, a technical article often enough to have something "hard to bite into," more and shorter book reviews, more reading and reference lists, more teaching units that have actually been tried, just now and then an article in theoretical or philosophical biology, more news letters and short items, not much editorializing. To the extent that they are able, the editorial staff will try to provide these about as ordered by the customers.

JOHN BREUKELMAN

PROPOSED AMENDMENT

It was proposed by the Detroit Biology Club at its meeting April 9, 1946, that Article IV, Section 3 be changed by deleting the word "and" after "local" and adding after "committees" the words "and regional and state membership chairmen." If this proposal is voted upon favorably, the entire section will then read: "There shall be a Representative Assembly, which shall consist of the officers of the Association, members of the editorial board, members of the advisory board, all past-presidents, delegates from each affiliated local, chairmen of all standing committees and regional and state membership chairmen. The Representative Assembly shall be the official governing body of the Association and shall convene at the time specified for the business meetings of the Association." The effect of the proposal is thus to make the chairmen of state and regional membership committees members of the Representative Assembly.

JUST ARRIVED at the editor's desk—*Laboratory Manual for General Zoology*, by Edward C. Colin, Chicago Teachers College. The readers of long standing will recall that Dr. Colin was the editor-in-chief in 1941. He has been an associate editor since that time and was the guest editor of the Genetics issue.

NATIONAL EDUCATION WEEK

The week beginning November 10 has been designated as American Education Week. Many kinds of materials have been developed for the aid of teachers in observing this important occasion. Two plays, *The Circus and the Jungle* and *America—Unlimited,* are available for the elementary grades and high school respectively. Radio scripts and movie trailers may be obtained. Two leaflets, *An Invitation,* to be used to invite parents and others to visit the schools, and *It Pays,* which deals with education as an investment, have been prepared in 3 × 5 inch size, also a pocket size reprint of the pamphlet *Education—A Mighty Force.*

All these materials may be obtained from the National Education Association, 1201 Sixteenth Street, N.W., Washington 6, D. C. Quantity discount rates are in effect for the items. Write the NEA for detailed information.

1947 NATIONAL TEACHER EXAMINATIONS

The American Council on Education has announced the eighth annual administration of its National Teacher Examinations, in official examining centers throughout the United States on February 8 and February 15 in 1947. Arrangements are now being made for the establishment of examining centers in connection with school systems and collegiate institutions engaged in teacher education.

The National Teacher Examinations were made available by the American Council on Education as an aid to administrators in their efforts to improve the selection of teachers. The tests included in the battery are designed to provide objective measurement of certain of the abilities and knowledges of prospective teachers. They measure the intellectual, academic, and cultural backgrounds of prospective teachers, and are used in combination with records of experience, academic marks, ratings in various aspects of personality, etc. in the evaluation of an individual's qualifications for teaching.

The sponsors of the program emphasize the fact that misuse of the examination results as a sole basis for teacher selection is opposed. Records of experience, academic marks, ratings of various aspects of personality, etc. should be considered in addition to the National Teacher Examination record in the evaluation of a prospective teacher's competency. Used in combination with additional information of the types named, it is believed that the National Teacher Examination results can contribute materially to the attainment of education's fundamental goal, the provision of the best possible instruction for young people in the schools.

Arrangements for cooperation in the Teacher Examination project may be made by writing to Dr. David G. Ryans, Associate Director, National Committee on Teacher Examinations, American Council on Education, 15 Amsterdam Avenue, New York 23, New York.

NEWS ITEMS

A FORTHCOMING CONSERVATION UNIT will include a series of leaflets prepared by the Educational Relations Section of the Soil Conservation Service, Region 5, Lincoln, Nebraska, under the direction of Adrian C. Fox, head of the Section.

THE FIFTIETH ANNIVERSARY YEARBOOK of the Educational Press Association, of which this journal is a member, is off the press. It contains a complete list of educational periodicals in the United States, as well as a series of articles dealing with educational journalism in this country. Order from Educational Press Association, 1201 16th Street, Washington 6, D. C. The price is $2.75.

ELMO N. STEVENSON, Associate Editor, has become the president of Southern Oregon State College, Ashland, Oregon. He has indicated that he wishes to retain his connection with the journal.

LOREN W. MENTZER, Instructor in Biology at the State Teachers College, Emporia, Kansas, has joined the staff as Associate Editor in charge of exchanges. The Editorial Board at the last meeting authorized the selection of an associate editor located in Emporia, charged with the specific responsibility of checking exchanges and preparing *Biological Briefs.* Mrs. Ruth Sherman Stein, who formerly prepared the briefs, has asked to be relieved of this duty, but will remain as associate editor.

A. J. CARLSON and A. C. IVY, both loyal supporters of NABT and contributors to the journal, are president and secretary-treasurer, respectively, of the newly organized *National Society for Medical Research.* One of its activities for which it has recently received some publicity is that of combating antivivisection propaganda.

THE BIOLOGY SECTION OF THE CENTRAL ASSOCIATION OF SCIENCE AND MATHEMATICS TEACHERS will meet in Detroit Friday, November 29. With Managing Editor O. D. Roberts as Vice Chairman, Past President Helen Trowbridge as Secretary, and President-elect Howard Michaud on the program with an illustrated lecture, our association will be well represented.

OTHER MEETINGS OF IMPORTANCE are our own national convention in Boston (more details in the November issue) December 27 and 28, and the Boston meeting of the American Nature Study Society, December 27.

BIOLOGY FOR YOU by B. B. Vance and D. F. Miller, is out and will be reviewed soon. Vance is one of our efficient associate editors and Miller is a member of the advisory staff. Both have made many valuable contributions to the journal. The readers of ABT will take special pride in *Biology for You*.

RICHARD F. TRUMP, back on the job at Ames Senior High School, Ames, Iowa, writes "during the latter part of my connection with the Navy I was suddenly changed from a specialist in guns to a rat-catcher and controller of plague and typhus; in this work I associated with several biology-teachers-on-leave."

MARY DORA ROGICK, one of our most faithful contributors, is preparing a zoology laboratory manual in which will appear some diagrams and other features which have been published in *The American Biology Teacher*.

WITH THE PUBLICATION of *Toward Mental Health*, the Public Affairs Committee, publishers of a series of popular 10-cent digests of authoritative research, marked its tenth anniversary.

TREASURER'S REPORT

Herewith is presented a condensed report of the treasurer, as of July 1, 1946. A further summary will be presented in an early issue. The next fiscal year will start January 1 instead of July 1 as in the past.

Receipts

Balance, July 1, 1945	$ 643.55
Advertising	1425.13
Dues, including advance dues	4815.70
Miscellaneous, including back numbers sold	214.09
Gifts for AAAS building fund	42.25
Total	$7140.72

Expenditures

Science Press, printing journal	$1705.80
General printing and stationery	297.30
Officers' expenses	681.19
Annual meeting and transportation	116.88
Membership campaigns	598.04
Miscellaneous	519.74
Total	$3918.95
Bank balance, July 1, 1946	3221.77
	$7140.72

CHANGE IN FISCAL YEAR

Among the more important actions taken at the St. Louis Meeting was to change the fiscal year so that it will correspond to the calendar year instead of to the school year. This change will make possible more accurate financial and membership bookkeeping and will more closely coordinate the Association's activities with the National Meeting. The mechanics of making the change will be as follows: All members are being billed for $2.75, 75 cents for the remaining balance of 1946 and $2.00 for 1947; thereafter the annual $2.00 membership will correspond to the calendar year. Volume 9 of *The American Biology Teacher* will have eleven numbers instead of the usual eight, October, November, December, 1946, and all of 1947; thereafter each volume will start with January and end with December.

Estimated Assets

Bank balance, July 1, 1946	$3221.77
Salable back numbers	800.00
Advertising accounts outstanding	459.67
Supplies and bills receivable	91.25
Total	$4572.69

Estimated Liabilities

Advance payment of membership	$1877.03
Science Press, to May issue inc.	2260.39
AAAS building fund gifts received	42.25
Total	$4179.67
Balance	393.02
	$4572.69

American Biology Teacher

Total paid for 1945–6 (Vol. 8)	2127
Exchange memberships	18
Extra copies, to officers, associate editors	369
	2514

Memberships

Renewals from 1944–5 membership list	1304
New members	823
Total	2127

M. A. RUSSELL

The Realm of Nature

ALFRED NOVAK
Michigan State College, East Lansing, Michigan

Through the ages, men and women, boys and girls, of every nation, in the country and city, have sought something in the woods, in the fields, on the seas, rivers and lakes, in the valleys, the mountains and on the plains. Each generation has produced those individuals whose intense interest in nature has led them to describe and explain it. These men such as Darwin, Thoreau, Audubon and Jacques enjoyed the warmth of communion with nature. Every decade brings millions into the "wilderness" to explore, to search, and to enjoy.

What is this eagerness, this strange attraction to nature? Is it inherent or is it a learned reaction? Why do people like the great outdoors? Some folks go for the peace that is there; the stillness of space and the soft, languid flow of water. Others seek the beauty—trees in blossom and the rich green of grass. Others go to be soothed by the gentle swaying of leaves and the golden glow of sunset. Some return to dream of far-off hills and the fight of salmon upstream. Boys go to seek adventure—the adventure of being lost in the woods and sleeping on a bed of leaves, the thrill of stepping on a snake or just seeing one. Older folk go for sweet nostalgia—initials on a tree and swaying wagon ruts through the woods. Some people are just curious—the hexagonal cell of the beehive and a walking-stick in pose. Children like its freedom—to do heroic things, to catch a young rabbit and to throw stones into a pond. Finally, man goes back to nature for the order there—green sprouts every year, sulfur butterflies each spring.

Let us analyze it. Is the color green soothing, or do we just think it is? Does one *learn* to seek curious items of interest or is this tendency a *natural* one? Do most humans at one time or another seek the peace and quiet of nature or are they taught to rest and relax there? Are we innately adventurous or do we get this trait through experience, reading and imitation? What happens during the early life of an individual to create a love for the outdoors? Why do some take to it from childhood and others not until after middle age? Why do some miss it entirely or do they all return at some stage or another?

Many naturalists trace their first interest to a book, a teacher, a visit to the zoo, or to picking up an earthworm or beetle. Perhaps Lewis Carroll instills the urge when he writes

"Will you walk a little faster?"
said a whiting to a snail,
"There's a porpoise close behind us,
and he's treading on my tail,"
See how eagerly the lobsters and the
turtles all advance!
They are waiting on the shingle—
will you come and join the dance?

The effect of nature on mind and body is seldom discussed. Nonetheless, the phenomenon of the outdoors is an important factor in the lives of untold millions. It must be crystallized. In this phenomenon, man acquires a greater view and understanding of life. In this phenomenon, man associates things, names things, recognizes things and predicts things. This is enjoyable. There is sheer pleasure in finding in May the expected May apples, of recognizing and calling a tree a spruce or hickory, and of predicting a rain storm from low clouds, no sun, and extreme whiteness all around. These things are in nature and they enrich the lives of mankind—perhaps they give man a grasp on this earth.

Nature vexes us; it challenges us and offers untold possibilities. We are seekers of knowledge—we like to know things. What animal is that? Why the rings around the moon? Is that poisonous? What are we here for? We seek *big* answers in nature. We observe and study. Those who cannot arrive at these answers, those who are "too busy," those too dull to try, those too for away from the soil, those too wound up in machines—these turn away from nature and align themselves with artificial pastimes, with civilized devices, and toys. However, the civilized man generally comes back—back to the old garden, the old woods, and the old hat. He comes back to the old swimming hole, to the Spring peepers and the old rod; back to the simple life, to the peace and security of Nature.

Making Field Trips Worthy

If the outburst of enthusiasm that follows the mere mention of a field trip in our classes assured its success the instructor's problem would be simple. Unfortunately, to many students it means escape from schoolroom activity and uninhibited freedom of a sort that seldom results in satisfactory achievement. Because of the fifth of the class which are in this group administrators and parents sometimes frown upon using school time for field work. Other factors also have made it increasingly difficult to take groups out. City instructors, who need field trips particularly, find the time element, distance to desirable areas, and liability for students' safety discouraging handicaps. Delays and routines often prohibit use of a trip to meet exigencies of classroom work when it would be most beneficial.

Field trips require as much planning as a classroom recitation or laboratory period. Students should get more from them than an armful of specimens to carry back to the laboratory or a list of organisms identified. These are desirable concomitants. But in secondary schools emphasis must be placed on the social objectives of biology whenever possible. We must stress those which require interpretative thinking and have social significance. If we consistently seek these broader objectives it will overcome some of our current difficulties.

Like every other school activity the field trip should have a worthwhile purpose. Bright students at times, can

profit from undirected activity, but many of our girls and boys have little ability to gain much from free experiences. Even general directions are of little use to them. For these it is best to set definite and specific goals. They need definite questions which ought to be useful in understanding the common experiences of living. We can't expect them to think about the problems of the community unless they get started on some. Hypothetical problems are of much less value than real ones which can be identified with a specific situation.

In its broadest sense the field trip means first-hand contact with the natural environment. Usually, study centers around such topics as adaptability of various organisms to the environment, biological survey of the neighborhood, tree study, or approaches associated with the unit being studied. With a definite purpose it is as worthwhile to visit a hospital, laboratory, or sewage disposal plant as to take a class to a field or pond. These are part of our environment.

Because of the time element and other administrative considerations it is evident that we must seek study areas close at hand. Vacant lots, city parks, and even the school block offer opportunity for biological census taking, plant structure, and ecological relations. Based upon the organisms and conditions present there should be opportunity for some socially valuable thinking. This biology of the student's own doorstep has much to teach about the community and the student's relation to it. Some questions which have been found useful in stimulating thinking seem worth mentioning.

What kinds of organisms survive here? How are they fitted to live under these conditions?

What conditions here prevent other organisms from making this their home?

Why are some organisms more abundant than others?

How have the organisms changed this environment?

Can you find a case where one of the organisms living here has made possible the life of another in the same area?

Problems such as the following are useful in bringing out mans' relationship to his environment.

What evidence can you find that the soil of your community is being lost? What can be done to avert this?

How has man changed the environment and how has the change affected other men?

What can you learn about the organisms in the environment that can be applied to man's betterment?

Is this vacant lot an eyesore, a recreation center, or a health problem? What responsibility have the people who own vacant lots to those who must live near them? Why can this lot remain undeveloped while many people are seeking places to live?

If prepared directions are given it is frequently possible to send pupils out on their own after school. Most of the foregoing problems can be attacked by individual student investigators when the difficulties of making group field trips are insurmountable. It is most important to make sure that the things we ask them to think about are within their grasp and that they have worthwhile relationship to life as it is being lived.

Robert L. Luse,
Elizabeth, New Jersey

RECENT PUBLICATIONS

Fosdick, Raymond B., *A Review for 1945*, The Rockefeller Foundation. 1946. 63 pp.

The annual brief but comprehensive report of the activities of the Foundation, including a summarized statement of the appropriations, which totalled more than $11,000,000 in 1945.

The State and Sectarian Education. Research Bulletin of The National Education Association, Vol. XXIV, No. 1, Feb. 1946. 44 pp. 25c.

A review of the constitutional, statutory, and judicial bases of the relationship of church and state with reference to education.

Armstrong, D. B., M.D., *Facts and Fallacies in the Integration of National Voluntary*

Health Agencies, Condensed from the Journal of the Am. Med. Assn., 1946. 8 pp.

A brief discussion of four facts and four fallacies; biology teachers may not agree with all the statements made, but they would do well to read what the author has to say about this important subject. Write The National Health Council, 1790 Broadway, New York, for copies.

LONERT, A. C., *Turtox Microscopy Booklet,* General Biological Supply House, 761–763 E. 69th Place, Chicago, Illinois. 1946. 43 pp.

An excellently illustrated booklet including discussion of general microscope practice, light filters, polarized light, stereoscopic vision, micro-projection, and many other subjects. Many of the articles have appeared from time to time in *Turtox News,* a monthly leaflet published by the same firm.

LYSENKO, T. D., *Heredity and its Variability,* Kings Crown Press, Morningside Heights, New York. 1946. 72 pp. 50c.

A somewhat heated exposition of the author's beliefs that many characteristics commonly called hereditary are derived from the environment. It must be read with the most extreme caution, because many of the sentences do not say what at first glance they seem to say. The translator, the well known Th. Dobzhansky, says that "his undertaking the work of translation does not imply agreement with the contents of the book, and that he reserves the right to criticize it as he sees fit."

JACK, HOMER A., *Biological Field Stations of the World.* Chronica Botanica, Vol. 9, No. 1, 1946. $2.50. 74 pp.

A comprehensive listing of biological field stations, with introductory materials on the history, administration, equipment, instruction and research at such institutions. Older readers of THE AMERICAN BIOLOGY TEACHER will recall Jack's articles on such stations in the March and April 1940 issues, entitled "Close to Nature."

Drugs and Pharmaceuticals, Inquiry Reference Service, U. S. Department of Commerce, Washington 25, D. C.. 23 pp.

A list of basic information sources, including government and non-governmental publications.

GREGG, CLIFFORD C., *Report of the Director,* Chicago Natural History Museum, Jan. 1946. 135 pp. $1.00.

An illustrated report of the various activities of the museum, including details of the departments, financial statement, list of accessions, classified list of the members, and many other items of information.

Reviews

GRUENBERG, BENJAMIN C. and BINGHAM, ELDREA N. *Biology and Man.* Ginn & Co., Boston, 719 pp. 1944. $2.24.

Mechanical Makeup: This most recent text utilizes a simple 6 × 9-inch cover and slightly glazed paper with a sharp typography. The paper appears to be a trifle lighter than usual. There is little conscious indication of balance in the illustrations. In several parts of the text there are "islands" of straight print ranging from nine to thirteen pages in length. In the early part of copies received there is an unevenness of inking of cuts, some few evinced an obvious fading. There are no colored charts or illustrations of any type. The major emphasis of visual pictorial supplementation of copy is via line cuts, charts, effective cartoon-like plates and some half tones. The legends to the illustrations are thorough and most functional. The labels are more than adequate to these pictures. Some diagrams and cartoons are most dramatic and stimulating.

Subject Matter: The topics covered are listed, with parenthetic number indicating page allotment to each: differences amongst living things (52), nutrition (41), physiology (67), behavior, body coordination and endocrines (73), reproduction (76), origin and heredity (71), interrelations, and longevity of living things (53), health including human wealth, conservation, human breeding, psychology of modern living things and occupational hazards (53). The text attempts to pivot its biological information on its relationship to human biology.

The text includes an appendix, and index with pronunciation of more difficult terms, and a bibliography with one- or two-sentence analyses of valuable supplementary reading. The references are very recent, only six before 1936.

Learning Aids and Teacher Helps: Each chapter follows a definite pattern of a number of pointing directional questions, a series of academic material, line cuts and half tones, a summary called *In Brief,* a series of elaborated *Explorations and Projects,* some challenging the brighter students, and finally a sequence of direct questions. The brief two-sentence analyses of excellent recent topical references, a pronouncing index and superb legend phase of illustrations round out the aids. The placing of references at end of chapters would have been more satisfactory arrangement.

Psychological Soundness: This text book is organized into eight units, the titles of which are expressed in question form. As

an aid to understanding the big problems and generalizations involved, each unit is broken up into sub-questions. Direct answers to these questions are not often found in the text. The solutions of these problems will enable pupils to use the facts of biology in order to arrive at an understanding of ideas. The sub-questions focus attention on the main question of each unit and give direction to the formulation of its general understanding on the basis of knowledge of less general facts. This treatment exemplifies the inductive method of teaching, with emphasis on the role of synthesis in learning and on reflective thinking. Factual information and drill are subordinated to the goal of large understandings.

There are numerous explorations and projects at the end of each chapter. They should stimulate the pupil's thinking while at the same time they provide ample opportunity for practice in both inductive and deductive reasoning.

This book is readily adaptable to various courses of study.

ALAN A. NATHANS (Chairman) *New York*
MADELINE N. HERBERT, *Washington, D. C.*

YOCUM, EDWIN L., *Plant Growth*, The Jaques Cattell Press, Lancaster, Pennsylvania, 203 pp., Illustrated, 1945. $3.00.

This discussion of plant growth shows the relationship of the forces of nature acting upon a plant from seed germination to maturity. Some of the topics discussed are seeds, germination of seeds, roots, stems and buds, transpiration, hybridization, heredity and variation, plant hormones, and soil improvement. Technical terms are kept to a minimum, but are freely employed when accuracy and detail are dependent upon their usage. The author corroborates his information with experimental data whenever possible. There are twenty-five chapters which include twenty-five illustrations and sixteen plates. The glossary is relatively complete and the references and index are excellent. *Plant Growth* should be of interest to every high school and college student and undoubtedly will prove to be of great practical value to the gardener. The clear and concise method of presentation has made the more difficult problems come within the scope of the uninitiated biologist who wants to exercise plant care beyond the "weeding and watering" stage.

TED F. ANDREWS,
Stone Laboratory,
Put-in-Bay, Ohio

Anatomical Charts, RUDOLF SCHICK, Publisher, 700 Riverside Drive, New York 31, New York.

This series of anatomical and physiological charts has recently been enlarged by the addition of five new subjects. Two of these, dealing with the nutritive values of common foods in terms of calcium, protein, and minerals in average servings and the vitamins in average servings, are horizontally arranged, 44 × 35 inches in size. The other three are vertical charts treating, respectively, the respiratory system, the human skeleton, with minor arteries and pressure points, and the endocrine glands. The last named chart shows the glands in position in the body, natural size, and includes enlarged view insets of the major glands, also an inset showing the various gland relationships. All charts are either fully labeled or equipped with numbered keys and are available with explanations in English, Spanish, and French. They are mounted on linen and are available with or without spring rollers at $4.75 to $8.50, depending on size and type of material.

JOHN BREUKELMAN

THE CONSERVATION COMMITTEE is of the opinion that the calendar page has been given a sufficient trial and that the continuation of it should depend upon reader demand. This is in accordance with a long-established policy of *The American Biology Teacher*. For example, *Biological Briefs*, discontinued last year, will be resumed shortly because a large number of readers have asked for them. On the other hand, the feature, *Formulas for Biological Science*, was discontinued because of apparent lack of interest. Apparently the decision to discontinue it was correct, for there have been no requests for the feature. The *By the Way* column will be continued only as long as enough items come in to keep it going.

The American Biology Teacher makes every attempt to print what its readers want; if a considerable number of requests for the calendar page come in, it will be resumed; if not, it will not.

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NEW OFFICERS

The results of the election of officers of THE NATIONAL ASSOCIATION OF BIOLOGY TEACHERS for 1946–47 has been received from the secretary-treasurer. The elected officers, who will assume their duties January 1, 1947, are as follows:

President, E. Laurence Palmer, Cornell University, New York.

President-elect, Howard Michaud, Purdue University, Indiana.

First Vice-President, Lucile Evans, Milwaukee State Teachers College, Wisconsin.

Second Vice-President, Ruth Beatty, Grant High School, Portland, Oregon.

Secretary-Treasurer, M. A. Russell, Royal Oak, Michigan.

The new president needs no introduction to readers of *The American Biology Teacher*. He has been a member of the advisory staff since the early days of the journal and has made many contributions to its welfare throughout its life. As an outstanding teacher at Cornell University, as the author of The School Page in *Nature magazine*, as the editor of the *Cornell Rural School Leaflets* and as the author of numerous publications in conservation and rural education, he has an exceptionally large circle of acquaintances among teachers of biology, nature study and allied subjects. The association is indeed fortunate to have as its leader a man with such a record of achievement and service.

Biographical sketches of the other officers appeared in the May number. All of them have been active workers in THE NATIONAL ASSOCIATION OF BIOLOGY TEACHERS, having served on various committees and performed many special duties. All of them are leading teachers in biology in their respective states and areas. Each of them has broad interests and a comprehensive range of activities. The editorial staff extends on behalf of THE NATIONAL ASSOCIATION OF BIOLOGY TEACHERS and *The American Biology Teacher* congratulations and best wishes.

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THE STAFF

In order that readers may know who carries the chief responsibilities in the activities of THE NATIONAL ASSOCIATION OF BIOLOGY TEACHERS and *The American Biology Teacher* it is the policy of the journal to publish twice a year, in the October and February issues, a complete list of all staff members. Lists of chairmen and personnel of committees are published in connection with reports of their activities.

All these individuals are deeply interested in the improvement of both the association and the journal. They welcome suggestions from members and are ready to give assistance to anyone interested in writing items or other articles for the journal.

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President-elect: E. Laurence Palmer, Cornell University, Ithaca, New York.
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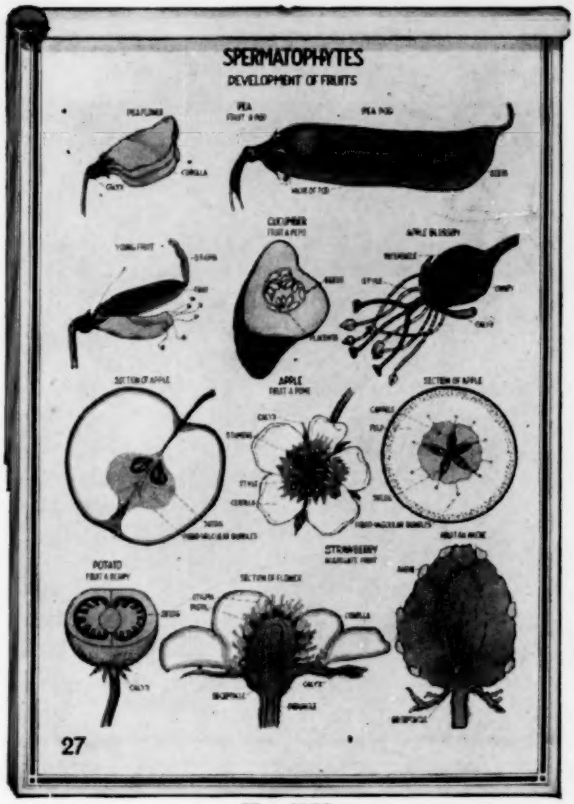

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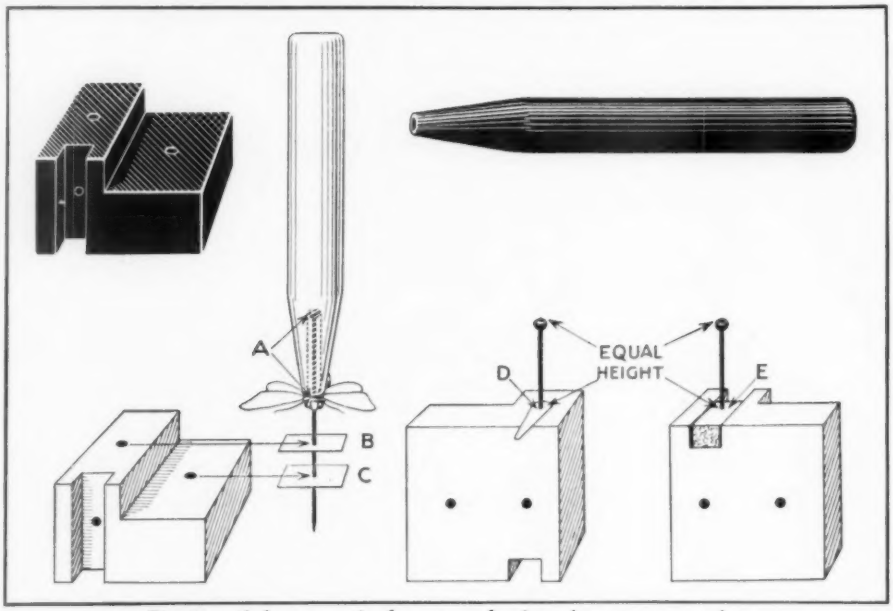

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